

Reduction of nasal fractures under local anaesthetic*

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SUMMARY

Forty five patients with fractured nasal bones underwent nasal fracture reduction under local anaesthetic. Patients used linear analog scores to assess pain associated with the procedure and satisfaction with the reduction. The surgeon also recorded his assessment of the reduction. The patients were reviewed two weeks later and the outcome scores repeated. The procedure was well tolerated and forty three patients (95.5%) stated they would undergo the same procedure again if they fractured their nose in the future. Fifteen patients (33.3%) had significant persistent nasal deformities and were listed for septorhinoplasty. The results of nasal fracture reduction under local anaesthetic are comparable to those obtained under general anaesthetic. The factors that may contribute to poor outcomes following reduction of nasal fractures are discussed.

Key words: nasal fracture, local anaesthesia

INTRODUCTION

Fracture of the nasal bone is the third most common fracture of the human skeleton (Murray et al., 1984).

Although this is a very common condition, treated primarily by otolaryngologists, the results of nasal fracture reduction have, in the majority of series, tended to be disappointing (Murray and Maran, 1980; Dickson and Sharpe, 1986; Watson et al., 1988; Owen et al., 1992). Reduction of nasal fractures appear to have similar success rates when performed under general and local anaesthetic (Watson et al., 1988; Cook et al., 1990; Owen et al., 1992). It is, however, mainly performed under general anaesthetic despite the potential risks of this form of anaesthesia.

This study aimed to examine reduction of nasal fractures performed under local anaesthetic in terms of patient acceptability and improvement of nasal deformity. Failed nasal fracture reductions were analysed and the factors that may contribute to poor cosmetic outcomes and the requirement for further surgery are discussed.

MATERIAL AND METHODS

Patients presenting to the ENT Department at Royal Bolton Hospital with nasal fractures that required reduction in the six month period between April and October 1999 entered the study. Patients under the age of 15 and two patients unwilling to

accept reduction under local anaesthetic were excluded. Fifty one patients entered the study. The procedure was clearly explained and informed consent obtained. A history of previous nasal injury, deformity and obstruction was recorded. The nasal bones, tip and septum were examined and the presence of deformities recorded. The age and sex of the patient, mode of injury and age of the fracture were noted. The patients assessed their nasal deformity using a mirror and by palpation prior to the start of the procedure. Both nostrils were packed with cotton wool soaked in 4 ml of 5% cocaine and 1:200 000 adrenaline. A subcutaneous injection of up to 1 ml of 2% lignocaine with 1: 80 000 adrenaline was made down both sides of the nose, using a single puncture of the skin at the glabella, in order to anaesthetise both external nasal nerves. Five to ten minutes later the nasal packs were removed and the adequacy of anaesthesia assessed. Reduction of the nasal bones was by digital pressure alone in the majority of cases. A McDonalds elevator (Thackray, England) was used to disimpact and elevate depressed fractures. Following elevation, a BIPP pack was inserted for 48 hours on the side of the depressed fracture.

The patients re-assessed their nasal shape by inspection and palpation and recorded their satisfaction using a linear analog scale from 1 to 10. A score of 1 indicated no improvement in nasal appearance. A score of 10 indicated the nasal appearance was the same as it was prior to its fracture. The patients also recorded the

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pain experienced during the procedure using a similar scale from 1 to 10. A score of 1 represented no pain and 10 the worst pain imaginable. The surgeon noted his assessment of the reduction. Patients were discharged home later that day when they felt well and scheduled for review two weeks later. They were sent up to two further appointments if they failed to attend.

The procedures were all carried out in the ward treatment room and performed by the author. External splints were not used and septal manipulation was never attempted. A note was made of any complications.

On review in the outpatient department (OPD), the patients recorded their satisfaction with the shape of their noses and asked if they would have the same procedure again if necessary. The nose was examined for any persistent structural abnormality and patients listed for further surgery if it was clinically appropriate; i.e. septoplasty for symptomatic nasal obstruction or septorhinoplasty for persistent nasal deformity.

RESULTS

In the six month period 45 patients entered into and completed the requirements for the study. Six additional patients attended for nasal fracture reduction under local anaesthetic but did not attend subsequent follow appointments offered to them. These patients have been excluded from further analysis.

Of the 45 patients, 32 (71%) were male and 13 (29%) were female. The average age was 28.2 years (range 15 to 56). Nine patients (20%) reported a previous nasal fracture. The aetiology of nasal injury is shown in Table 1.

The examination findings are shown in Table 2. Forty four patients had deviation of the nasal bones; 26 to the right and 18 to the left. There were 21 cases in which the nasal bones were very sharply angulated or kinked to the side of the deviation. Six patients had depressed nasal bones. Eleven patients complained of nasal obstruction since their injury and 12 patients were noted to have septal deviations. Four patients had deviation of the nasal tip.

Table 1. Aetiology of nasal injury.

Mode of nasal injury	Male	Female
Assault	27	7
Fall	2	3
Sport	3	1
RTA	0	1
Other	0	1

The average delay between injury and nasal fracture reduction was 10.5 days (range 4 to 24 days).

The pain associated with the procedure is shown in Figure 1. A linear analog score from 1 to 10 was used in each case, with 1 being the lowest possible score. The most frequent pain score was 1 out of 10 - this was reported by 16 patients (35.5%). Thirty three patients (73.3%) recorded pain scores between 1 and 3. Patients immediate and 2 week satisfaction scores are shown in Figure 2 and the surgeons assessments are depicted in Figure 3.

Table 2. Examination findings.

	right	left
Deviated nasal bones	26	18
'Kinked' nasal bones	9	12
Depressed nasal bones	1	5
Deviated septum	8	4
Deviated nasal tip	1	3

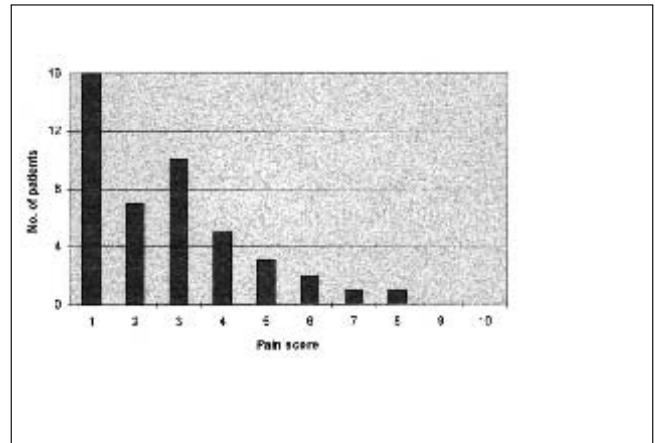


Figure 1. Pain associated with reduction of nasal fracture.

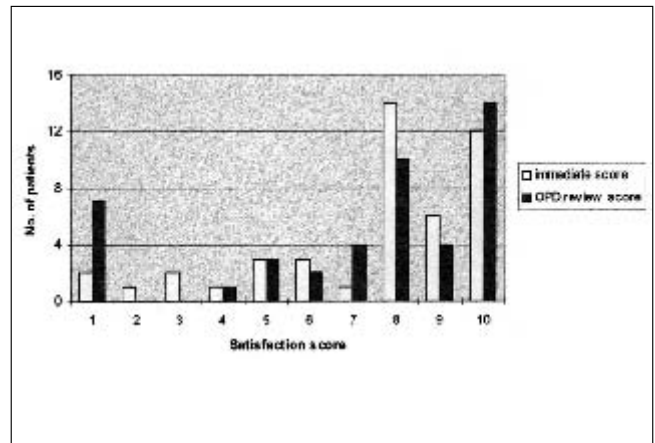


Figure 2. Patient satisfaction scores.

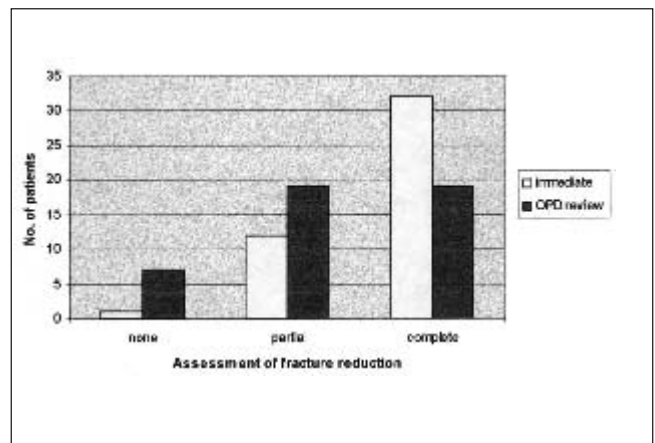


Figure 3. Surgeon assessment of fracture reduction.

Table 3. Patients listed for septorhinoplasty.

Age	Sex	Age of fracture	Potential factors contributing to poor result
22	male	12 days	left nasal bone depressed
27	female	12 days	nasal bones 'kinked' to right
20	female	12 days	left nasal bone depressed
18	female	10 days	none
41	male	15 days	nasal bones 'kinked' to right
38	female	9 days	septal deviation to right previous nasal fractures nasal bones 'kinked' to left
21	male	6 days	previous nasal fractures
41	female	16 days	none
36	female	12 days	septal deviation to left
30	male	11 days	nasal bones 'kinked' to left right nasal bone depressed
18	male	11 days	nasal bones 'kinked' to left
17	male	11 days	nasal bones 'kinked' to left
37	male	5 days	previous nasal fractures nasal bones 'kinked' to right septal deviation to right
20	female	7 days	left nasal bone depressed

One patient hyperventilated and the procedure had to be abandoned before completion. She subsequently had a nasal fracture reduction under general anaesthetic as the local anaesthetic procedure had no effect. One patient had a vasovagal attack following the procedure. There were no other immediate complications and all the patients were discharged home on the same day as surgery.

Forty three patients (95.5%) stated they would undergo the same procedure if they fractured their nose again in the future. Three patients (6.6%) were placed on the waiting list for septoplasty and 15 patients (33.3%) were listed for septorhinoplasty.

DISCUSSION

Previous studies have shown that patients appear to tolerate nasal fracture reduction under local anaesthetic well (Waldron et al., 1989; Cook et al., 1990). This series has also found this to be the case. The majority of patients (95.5%) stated they would have the same procedure again if necessary. Of the two patients who stated a preference for general anaesthesia, one hyperventilated and became extremely anxious during the local anaesthetic procedure. The other patient was disappointed with the poor result of surgery and was subsequently listed for a septorhinoplasty. These results differ vastly from those obtained in a recent study (Jones and Nandapalan, 1999). Only 27.8% of the 18 patients who underwent nasal fracture reduction after external infiltration of bupivacaine stated they would have the same procedure again if necessary. The anaesthetic technique involved multiple injections of 4mls of local anaesthetic into a small tissue space. It is unsurprising that the pain scores were high and this group of patients were reluctant to have the same procedure again. In the same study, 36 patients received topical local anaesthetic and 6 (16.7%) of this group stated a preference for general anaesthetic on a future occasion. This is significantly higher than the rate found in this and previous studies using

a similar external infiltration technique (Watson et al., 1988; Waldron et al., 1989; Owen et al., 1992).

The majority of patients were young men who had been involved in fights with right-handed opponents. This is in keeping with recent studies of patients with nasal fractures (Waldron et al., 1989; Cook et al., 1990).

The non-attendance rate for review was 11.7% (6 out of 51 patients). This is lower than other series (Murray and Maran, 1980; Houghton et al., 1998) and can be explained by the short interval to follow up and the policy of offering patients repeat appointments if they failed to attend.

The choice of anaesthetic technique does not appear to affect the outcome of nasal fracture reduction. The results are similar for general and local anaesthetic and local anaesthetic with sedation (Murray and Maran, 1980; Dickson and Sharpe, 1986; Watson et al., 1988; Waldron et al., 1989; Cook et al., 1990; Cook et al., 1992; Newton and White, 1998).

In this series of patients, the outcome scores at out-patient review tended to be lower than those recorded immediately after the procedure. This may be due to the infiltrated local anaesthetic obscuring the assessment of fracture reduction. It is, however, more likely that the nasal bones moved in the interval between fracture reduction and out-patient review. This could be due to further minor trauma or drift of the nasal bones back towards their pre-reduction position. Whatever the reason may be, these results suggest there is a group of patients who have a successful reduction initially, but when reviewed a couple of weeks later are found to have persistent cosmetic deformities. This emphasises the importance of reviewing patients after reduction of nasal fractures, and not, as is commonly practised, discharging them without follow up.

Septal manipulation was never attempted as I have not found it to be a useful technique in previous patients. The septum rarely stays in the midline and the technique runs the risk of causing further trauma and haemorrhage. Other authors have also found the results of septal manipulation to be poor (Wexler, 1975; Harrison, 1979; Dickson and Sharpe, 1986; Waldron et al., 1989).

The results of this series are comparable to previously reported results of nasal fracture reduction (Mayell, 1973; Harrison, 1979; Murray and Maran, 1980; Dickson and Sharpe, 1986; Watson et al., 1988; Owen et al., 1992). However, one third of the patients who underwent reduction of nasal fractures were later listed for septorhinoplasty. The details of this group of patients are shown in Table 3.

No patients had a second procedure in an attempt to reduce the nasal fracture and obviate the need for septorhinoplasty. This study aimed to examine the results of nasal fracture reduction under local anaesthesia and compare them to results obtained under general anaesthesia. It was felt that a second attempt at fracture reduction would have introduced a significant variable and made such a comparison invalid. A further study is planned to examine the results of a second nasal fracture reduction in patients in whom the initial attempt was unsuccessful.

Fifteen patients were placed on the waiting list for septorhinoplasty. There were 13 females in the group of patients studied

and 7 of these (i.e. 54%) were listed for septorhinoplasty. These figures compare to 8 out of 32 males (i.e. 25%) who were listed for septorhinoplasty. Although too much cannot be read into these figures as the overall number of patients was small, it does tend to suggest that the female patients were less willing to accept residual nasal deformities than their male counterparts. The average length of time from injury to fracture reduction was 9.9 days and can be discounted as a factor contributing to the need for further surgery.

Four of the six patients who had depressed nasal fractures were listed for septorhinoplasty. It is usually not technically difficult to elevate depressed nasal bones. A nasal pack is often inserted after elevation, but the nasal bones have a tendency to fall back in after removal of the pack.

It has been suggested that deviation of the nasal septum is a factor that often contributes to the failure of nasal fracture reduction. It has been suggested that the deviated septum places stress on the nasal bones causing them to displace following reduction (Fry, 1967). Previous authors have advocated that, in selected cases, limited septal surgery be performed at the same time as nasal fracture reduction in order to improve the cosmetic outcome (Harrison, 1979; Murray and Maran, 1980; Dickson and Sharpe, 1986). In this series there were 12 patients with deviation of the nasal septum and 3 of this group (25%) were listed for septorhinoplasty. Three patients were listed for septoplasty. The remaining 6 patients with septal deviations (i.e. 50% of this group of patients) were asymptomatic and did not require further surgery.

Nine patients gave a history of previous nasal fractures. Three of these patients (33.3%) were placed on the waiting list for septorhinoplasty.

There is a subgroup of patients who have extremely angulated or kinked nasal bones. The fracture appears to involve the middle part of the nasal bones and creates a very prominent ridge on the side of bony displacement. There were 21 patients with this type of nasal fracture and 7 of them (33.3%) had unsuccessful reductions of nasal fractures and required further surgery. It is possible that, in this subgroup, the bony fragments have a greater tendency to interlock and spring out of alignment following an apparently successful fracture reduction.

Nasal fracture reduction under local anaesthetic is well tolerated by patients and the results are comparable to those obtained under general anaesthetic. Factors contributing to suboptimal outcomes include: significant septal deviation, previous nasal trauma, and depressed or kinked fractures of the nasal bones. Reduction of fractured nasal bones under local anaesthetic in the out-patient setting should be the method of choice for adults with nasal fractures. General anaesthetic should be reserved for the small number of patients in whom primary septal surgery is also indicated. Further studies are underway to develop a protocol for the management of fractured nasal bones, which will enable the clinician to predict which patients are likely to have a poor result with nasal fracture reduction alone. This should enable the patient to have a more realistic expectation of the outcome of the procedure and the possibility of further surgery.

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